



US005364845A

**United States Patent**

[19]

**Henderson**[11] **Patent Number:** **5,364,845**[45] **Date of Patent:** **Nov. 15, 1994****[54] GLUCOSAMINE, CHONDROITIN AND MANGANESE COMPOSITION FOR THE PROTECTION AND REPAIR OF CONNECTIVE TISSUE****[75] Inventor:** **Robert W. Henderson**, Baldwin, Md.**[73] Assignee:** **Nutramax Laboratories, Inc.**, Baltimore, Md.**[21] Appl. No.:** **40,936****[22] Filed:** **Mar. 31, 1993****[51] Int. Cl.<sup>5</sup>** ..... **A61K 31/715; A61K 31/70****[52] U.S. Cl.** ..... **514/54; 514/62****[58] Field of Search** ..... **514/62, 474, 801****[56] References Cited****U.S. PATENT DOCUMENTS**

3,232,836	2/1966	Carlozzi et al.	167/65
3,371,012	2/1968	Furuhashi	167/59
3,683,076	8/1972	Rovati	424/180
3,697,652	10/1972	Rovati et al.	424/180
4,006,224	2/1977	Prudden	424/325
4,414,202	11/1983	Silvelly	424/180
4,486,416	12/1984	Soll et al.	424/180
4,647,453	3/1987	Meisner	424/54
4,772,591	9/1988	Meisner	514/62
4,801,619	1/1989	Lindblad	514/825
4,983,580	1/1991	Gibson	514/2
5,141,928	8/1992	Goldman	514/54
5,162,303	11/1992	Goodman	514/2

**OTHER PUBLICATIONS**

"Chondroprotective Agents Glucosamine Salts and Chondroitin Sulfates", Luke R . Bucci, Townsend Letters for Doctors, Jan. 1994, pp. 52-54.

Christensen, "Nutritional Support for Three Phases of Rehabilitation" Chiropractic Products, pp. 100-102, Apr. 1993.

Murray, "A Natural Treatment of Osteoarthritis", MPI's Dynamic Chiropractic, pp. 8-10, Sep. 12, 1993.

Morrison, et al., "Coronary Heart Disease and the Mucopolysaccharides (Glycosaminoglycans)", C. C. Thomas, Publisher, 1974, pp. 109-127.

Drovanti et al, "Therapeutic Activity of Oral Glucosamine Sulfate in Osteoarthritis; A Placebo-Controlled

Double-Blind Investigation", Clin Therap. 3 (4) 260-272 (1980).

Karzel et al, "Effects of Hexosamine Derivatives and Uronic Acid Derivatives on Glycosaminoglycane Metabolism of Fibroblast Cultures", Pharmocol. 5, 337-345 (1971).

"Current Therapy in Equine Medicine", Robinson, Editor, W. B. Saunders Co., Publisher, pp. 402-403 (1987).

Garrison, Jr., et al, "The Nutrition Desk Reference", Keats Publishing, Inc., pp. 70-71 (1985).

Bucci, "Manganese: Its Role in Nutritional Balance", Today's Chirop., 17 (2) 23-28, 44 (1988).

Bucci, "Glucosamine-A New Potent Nutraceutical For Connective Tissues", The Nutritional Supplement Advisor, Jul. 1992.

Banks, "Applied Veterinary Histology", Williams and Wilkins Publisher, pp. 84-85 (1986).

Setnikar et al, "Pharmacokinetics of Glucosamine in the Dog and in Man", Arzneimittelforschung 38 (2) 729-736 (1991).

Vidal y Plana et al, "Articular Cartilage Pharmacology: I. In Vitro Studies on Glucosamine and Non-Steroidal Anti-inflammatory Drugs", Pharm. Res. Comm., 10 (6) 557-569 (1978).

Anon., "Using a Chondroprotective Drug in Treating Dogs With Osteochondrosis", Veterin. Med., 130 (1993).

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**[57]****ABSTRACT**

A therapeutic composition for the protection, treatment and repair of connective tissue in mammals and a method for the treatment of connective tissue in mammals by the administration of the composition. The composition includes glucosamine and preferably chondroitin sulfate. The composition further includes manganese ascorbate which catalyzes the production of collagen and proteoglycans from the glucosamine and the chondroitin sulfate.

**18 Claims, 3 Drawing Sheets**